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B62D 25/18

(52) UK CL (Edition O)
B7J J82D3

(56) Documents Cited
GB 2242876 A GB 2184702 A GB 2146598 A
GB 2143189 A GB 2139974 A GB 2050272 A

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Online: WPI, EDOC, JAPIO

# (54) Vehicle spray condenser

(57) A panel or flap that is secured and suspended behind vehicle wheels comprises a series of angled louvres 1 which act as a deflecting means and are supported and secured to vertical side walls. To the rear of the louvres 1 and situated on the forward face of the rear panel, there is a series of vertical curved channels 2 so as to control debris and condense spray into water which is forced down and out of an exit which together with the discharged water and debris is protected from the effects of external air-flow/slip-stream by the lower semi flexible flap 4 which also acts as a deflecting means in order that spray and debris thrown to the rear from the lower section/treads of the tyres is directed to the road surface.

FIGURE 1

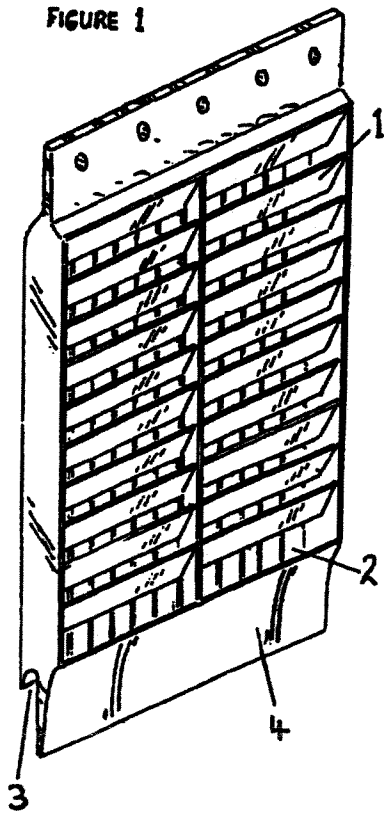


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FIGURE 1

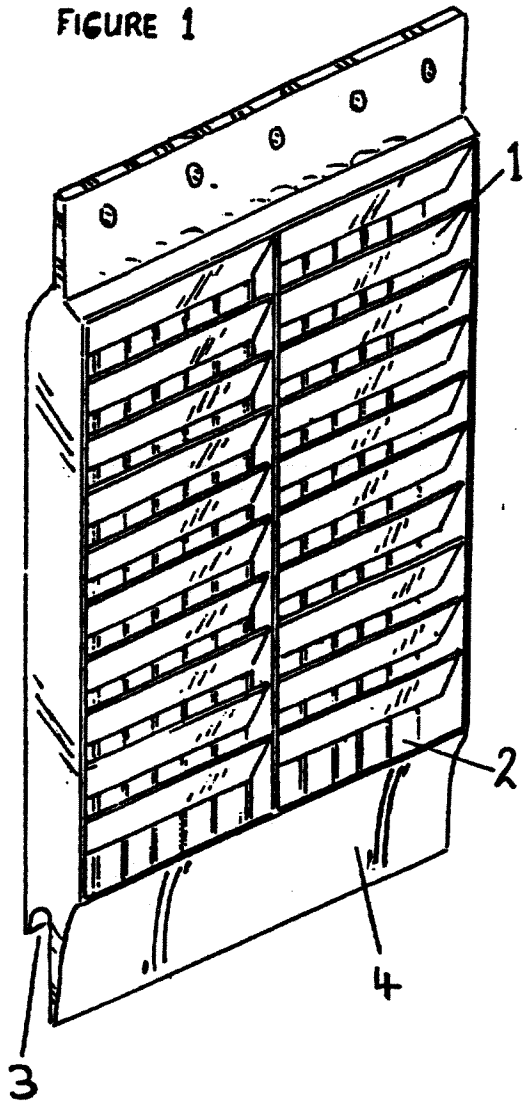



FIGURE 2

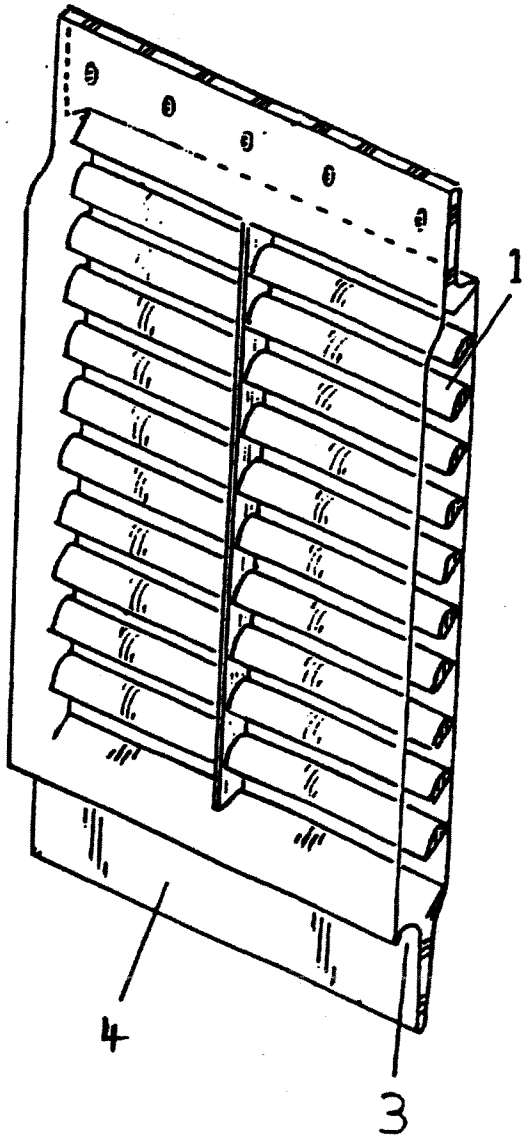


FIGURE 3

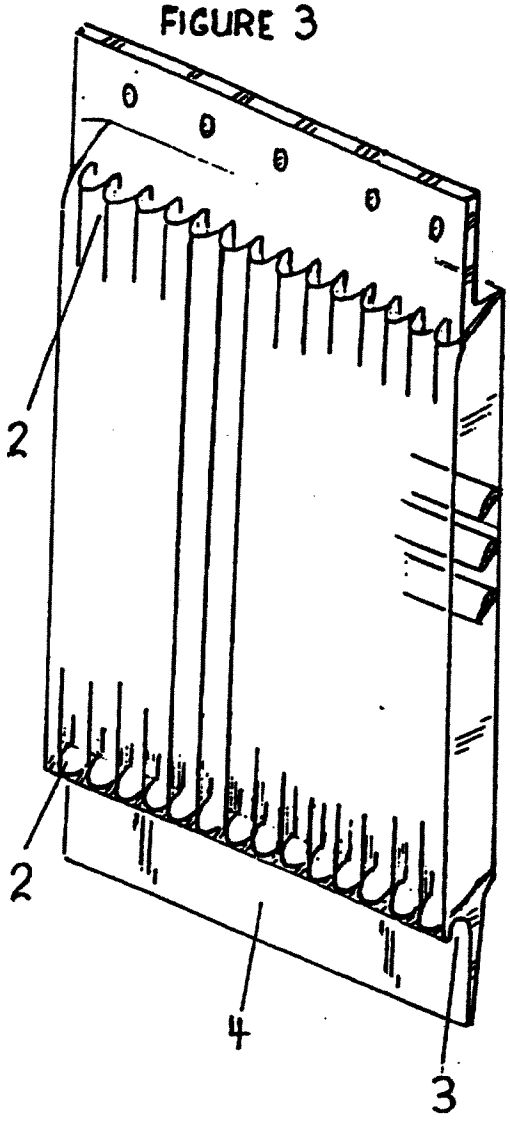



FIGURE 4

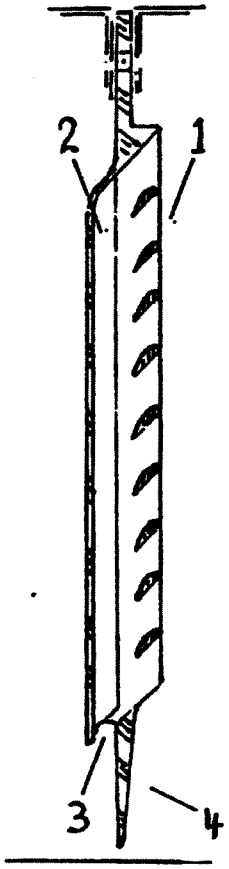



FIGURE 5

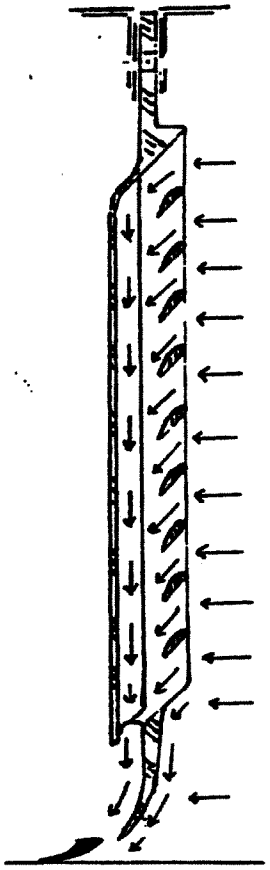
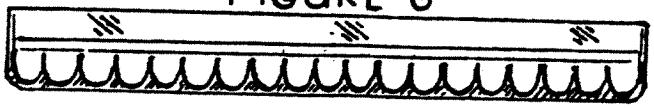


FIGURE 6



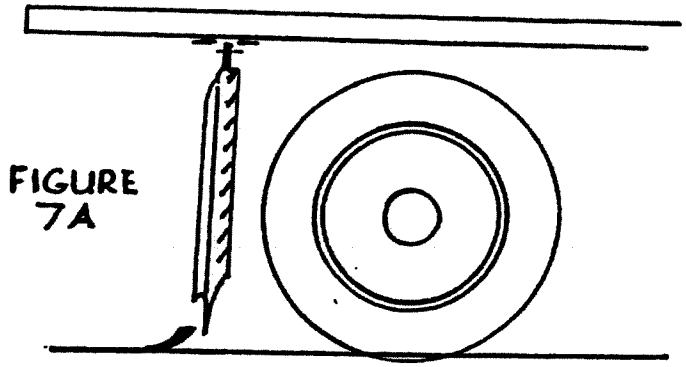


FIGURE 7A

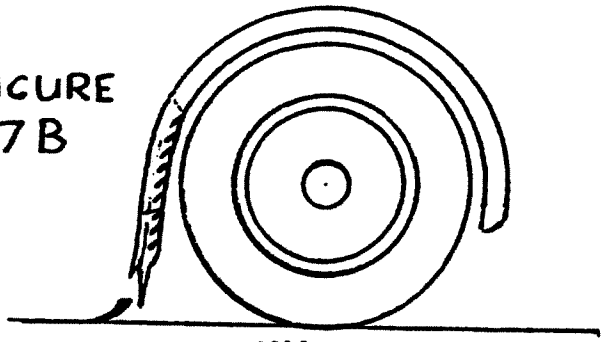


FIGURE 7B

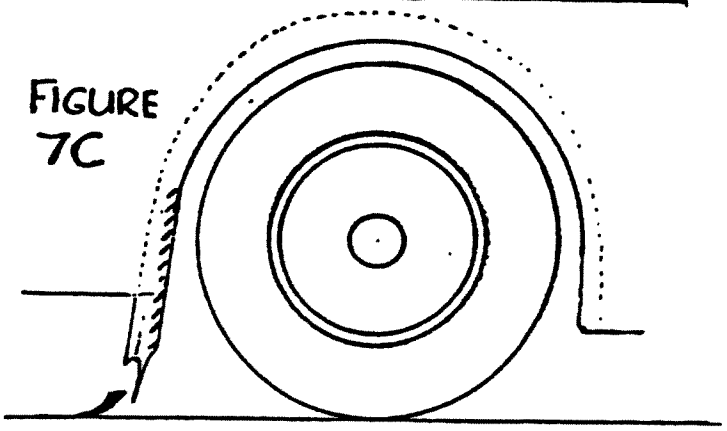


FIGURE 7C

# VEHICLE SPRAY CONDENSER FLAP

This invention relates to a flap fitted behind the wheels of a vehicle in order to control spray and small debris.

Spray/Mud flaps are well known as rubber flaps of various shapes and sizes situated behind the wheels of vehicles in order to control spray and debris thrown to the rear by the tyres. Many flaps consist of a plain or flat forward face whilst others use a system of bristles or perforations.

These spray/mud flaps are, however, incapable of controling more than moderate amounts of spray and even less control of small debris such as small stones with the result that much spray and debris is dispersed in all directions thus effecting drivers to the side and rear. In addition, the bristles or perforations become clogged with dirt which reduces efficiency whilst the generally flat surface presented to the air stream produces considerable drag upon the vehicle.

According to the present invention, there is the means to control debris and large amounts of spray which is returned to the road surface in a controled and safe manner whilst reducing drag upon the vehicle and being self cleaning.

A specific embodiment of the invention will now be described by way of example with reference to the accompanying drawings:-

Figure 1 shows in perspective, the louvres, vertical channels, water exit and lower flexible flap in position.

Figure 2 illustrates the angle and positions of the louvres with-in the vertical side walls and additional vertical support.

Figure 3 illustrates the vertical curved channels to the rear of the louvres and across the forward face of the rear panel.

Figure 4 shows from the side, the disposition of the louvres, vertical channels, water exit and lower flexible flap.

Figure 5 shows from the side, the flow of spray, debris and water as illustrated by the directional arrows.

Figure 6 shows from above, the louvres to the front and vertical curved channels to the rear.

Figure 7a shows from the side, the large truck format.
Figure 7b shows from the side, the mud/guard format.
Figure 7c shows from the side, the wheel arch format.

Referring to the drawings, the vehicle spray condenser flap is secured behind the wheels of the vehicle.
In order that in-comming spray and debris is controled and deflected there is provided a series of horizontal louvres 1 angled down to-wards the rear whilst being supported and secured to and with-in the forward part of the vertical side walls and additional vertical supports as deemed neccessary for good strength and stabilty.
Debris and spray is deflected down and to the rear by the louvres 1 and into the vertical curved channels 2 where the impacted spray is condensed into water. The down-ward flow of debris and water with-in the vertical channels 2 is enhanced by the the continuous process and velocity of in-comming air, spray and debris created by the speed of the vehicle.
In order that water and debris can be discharged, there is provided an exit 3 which is situated below and across the the width of the vertical channels 2. Protection of the dis-charged flow of debris and water from turbulence created by the speed of the vehicle is provided by the lower flexible flap 4 which is situated in front of the water exit and across the full width of the main flap and extends down close to the road surface. In addition to it,s use as protection of the dis-charged flow of water, the flexible flap 4 provides the means to deflect spray and small debris thrown to the rear from the lower treads of the tyres so that it is returned to the road surface or absorbed into the flow of water from behind the flexible flap 4 which by it,s flexible nature is less prone to damage from obstructions particularly when the vehicle is reversing.

CLAIMS

1 A vehicle spray condenser flap comprising the means to control debris and large amounts of spray which is returned to road surface in a safe manner.

2 A vehicle spray condenser flap as in claim 1 where-in control and deflecter means is provided by horizontal louvres 1 which deflect debris and spray down to the rear.

3 A vehicle spray condenser flap as in claim 1 and claim 2 where-in control means is provided by vertical curved channels into which deflected spray is impacted and condensed into water.

4 A vehicle spray condenser flap as in claim 1 and claim 3 where-in debris and water in and from the vertical channels 2 are dis-charged through and out of the exit 3.

5 A vehicle spray condenser flap as in claim 1 where-in the dis-charged flow of debris and water from exit 3 as in claim 4 is protected from turbulence by the lower flexible flap 4.

6 A vehicle spray condenser flap as in claim 1 where-in the lower flexible flap 4 provides additional means to deflect debris and spray thrown to the rear from the lower treads of the tyres in order that the spray and debris is returned to the road surface or absorbed into the discharged flow of water from exit 3.

7 A vehicle spray condenser flap as in claim 1 where-in it can be adapted for all vehicles by those skilled in automotive design and production.

8 A vehicle spray condenser flap as in claim 1 would preferably be made of rubber but other materials such as plastics or metals or a composition of these can be used.

9 A vehicle spray condenser flap as in claim 1 could be incorporated into vehicles at the time of production or sold as an accessory.

10 A vehicle spray condenser flap substantially described here-in with reference to Figures 1-7 of the accompanying drawings.

**Amendments to the claims have been filed as follows**

Vehicle Spray Condenser

1 A vehicle spray condenser in the form a flap fitted behind the wheels/tyres of a vehice in order that air-flow and spray with-in can be deflected by horizontal louvres down into vertical curved channels where such spray is compressed/condensed into water which then flows down the channels to be ejected from an exit which is protected from the force of air-flow/slip-stream by the provision of a semi flexible lower flap which has the additional function of deflecting spray and debris thrown to the rear by the lower section/treads of the tyre to the road surface so that the over-all capacity to control spray and debris is improved whilst reducing drag upon the vehicle.

2 A vehicle spray condenser as in claim 1 where-in initial deflecter means is provided by a series of horizontal louvres which deflect spray and debris down and to the rear.

3 A vehicle spray condenser as in claim 1 and claim 2 where-in the louvres deflect debris and spray into the vertical curved channels into which debris and spray is impacted and such spray is compressed/condensed into water while debris is restrained from random dispersal.

4 A vehicle spray condenser as in claim 1, 2 and claim 3 where-in water and debris with-in the vertical channels is forced in a down-ward direction by the deflected force of air flow created by the louvres.

5 A vehicle spray condenser as in claim 1 and claim 4 where-in the spray and debris with-in the vertical channels can discharged down through an exit to the road surface whilst both exit and discharged debris and spray is protected from the effects of slip-stream and turbulence by the position of the lower semi flexible flap in front of the exit.

6 A vehicle spray condenser as claimed in claim 1 and claim 5 where-in the lower semi flexible flap extends down close to the road surface and has the additional function of deflecting down to the road surface, the spray and debris thrown from the lower section of the tyre.

7 A mud/spray flap as claimed in any preceeding claim which which controls debris and condenses spray and returns such matter to the road surface in a controled and safe manner.

8 A flap as claimed in any preceeding claim is preferably made from rubber or associated material although plastic metals or a combination of these can be used.

9 A vehicle spray condenser substantially as here-in described and illustrated in the accompanying drawings.

The Patent Office

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**Application No:** GB 9508778.9 **Examiner:** Colin Thompson
**Claims searched:** 1 to 9 **Date of search:** 24 May 1996

## Patents Act 1977
## Search Report under Section 17

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): B7J

Int Cl (Ed.6): B62D 25/16,18

Other: Online: WPI, EDOC, JAPIO

**Documents considered to be relevant:**

| Category | Identity of document and relevant passage | | Relevant to claims |
|---|---|---|---|
| X | GB 2242876 A | (Jones) Whole document relevant | 1 |
| X | GB 2184702 A | (Morin) Whole document relevant | 1 |
| X | GB 2146598 A | (Uniroyal Ltd) Whole document relevant | 1 |
| X | GB 2143189 A | (Dunlop Ltd) Whole document relevant | 1 |
| X | GB 2139974 A | (Maurice Goodall Ltd) Whole document relevant | 1 |
| X | GB 2050272 A | (Maurice Goodall Ltd) Whole document relevant | 1 |

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|---|---|---|---|
| X | Document indicating lack of novelty or inventive step | A | Document indicating technological background and/or state of the art. |
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